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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/767,399	01/29/2004	Chirag Deepak Dalal	VRT0129US	2875

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EXAMINER	
KROFCHECK, MICHAEL C	

ART UNIT	PAPER NUMBER
2186	

DATE MAILED: 09/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/767,399	DALAL ET AL.	
	Examiner	Art Unit	
	Michael Krofcheck	2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 January 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the amendment filed on 6/26/2006.

2. Claims 4, 6-9, 11-26 have been amended.

3. The objections/rejections from the prior correspondence not restated herein have been withdrawn.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bridge, US Patent 6405284 and Vishlitzky et al., US patent 5819310.

7. With respect to claim 1 and 13, Bridge teaches of a medium for storing computer executable instructions, wherein a method is performed in response to executing the

instructions (column 26, line 55-column 27, line 44); the method comprising: in response to a request to perform a set of operations on a plurality of logical volumes, identifying a first storage region of a plurality of storage regions to allocate for a first operation of the set of operations on a first logical volume of the plurality of logical volumes (fig. 11, items 1102, 1104; column 1, lines 35-51; column 19; lines 24-61); and

Vishlitzky teaches of a mirrored set, mirroring data from one logival volume to another (fig. 1; column 6, lines 25-40);

The combination of Bridge and Vishlitzky teaches of determining whether a second operation of the set of operations can be performed on a second logical volume of the plurality of logical volumes using a subset of the plurality of storage regions, wherein the subset excludes the first storage region (Bridge, fig. 11, items 1106; column 1, lines 35-51; column 19; lines 24-61).

It would have been obvious to one of ordinary skill in the art having the teachings of Bridge and Vishlitzky at the time of the invention to include locating the full mirrored partners on different logical volumes from each other. Their motivation would have been to facilitate reading operations from a mirrored pair of drives (Vishlitzky, column 4, lines 39-41).

8. With respect to claim 2 and 14, the combination of Bridge and Vishlitzky teaches of if the second operation cannot be performed using the subset of the plurality of storage regions, identifying a third storage region of the plurality of storage regions to allocate for the first operation (Bridge, fig. 11; column 1, lines 35-51; column 19;

lines 24-61; as when a sufficient mirror partner cannot be found, the primary extent is deallocated and a new primary parity extent is selected at 1102 again), and

determining whether the second operation can be performed using a second subset of the plurality of storage regions, wherein the second subset excludes the third storage region (fig. 11, items 1106; column 1, lines 35-51; column 19; lines 24-61).

9. With respect to claim 3 and 15, Bridge teaches of if the first storage region is allocated for the first operation on the first logical volume, de-allocating the first storage region, and including the first storage region in the second subset prior to determining whether the second operation can be performed (fig. 11; column 1, lines 35-51; column 19; lines 24-61; as when a sufficient mirror partner cannot be found, the primary extent is deallocated and a new primary parity extent is selected at 1102 again and the process goes forward as before).

10. With respect to claim 4 and 16, the combination of Bridge and Vishlitzky teaches of identifying a respective set of rules to configure each respective logical volume of the plurality of logical volumes prior to identifying the first storage region, wherein the respective set of rules for each respective logical volume is used to identify a respective storage region to allocate for the respective logical volume (Bridge, fig. 11; column 19, lines 40-44; the round robin algorithm is used to distribute the location of the extents across the disk drives).

11. With respect to claim 5 and 17, the combination of Bridge and Vishlitzky teaches of wherein the determining whether the second operation can be performed comprises examining a second respective set of rules for the second logical volume (Bridge,

fig. 11; column 19, lines 45-54; the other extents must be located in only the full mirror partners).

12. With respect to claim 6 and 18, Bridge teaches of determining a respective storage region to allocate for each respective operation of the set of operations by determining whether a remaining operation of the set of operations can be performed using an unallocated subset of the plurality of storage regions, wherein the remaining operation excludes the respective operation, the unallocated subset excludes the respective storage region, and the unallocated subset excludes an allocated subset of the plurality of storage regions wherein each storage region in the allocated subset is allocated to one of the set of operations (fig. 11; column 19, lines 24-61).

13. With respect to claim 7 and 19, Bridge teaches of wherein each operation of the set of operations is one type of operation (fig. 11; column 19; lines 24-61; the first operation is a parity extent allocation; the second operation is a data extent allocation, the third operation is a store of management information).

14. With respect to claim 8 and 20, Bridge teaches of wherein a first operation of the set of operations is a first type of operation (fig. 11; column 19; lines 24-61; the first operation is a parity extent allocation),

a second operation of the set of operations is a second type of operation (fig. 11; column 19; lines 24-61; the second operation is a data extent allocation), and

the first type and the second type are different (fig. 11; column 19; lines 24-61; the parity extent allocation is different from the data extent allocation as there are

different requirements that must be fulfilled. Additionally, the store of management information can also be interpreted as a second operation).

15. With respect to claim 9 and 21, Bridge teaches of wherein the first storage region conforms to a first intent of the first logical volume (fig. 11; column 19, lines 24-27, lines 40-44; the location for the parity extent is selected based on the round robin algorithm. Doesn't any storage region that is a logical volume conform to the intent of that logical volume. It must satisfy the requirements of the logical volume to be allocated as the logical volume).

16. With respect to claim 10 and 22, Bridge teaches of wherein the first intent comprises a first rule used to configure the first storage region to provide the first logical volume (fig. 11; column 19, lines 24-27, lines 40-44; the round robin algorithm (first rule) is used to select the storage location for the parity extent).

17. With respect to claim 11 and 23, Bridge teaches of performing the first operation on the first logical volume using the first storage region (fig. 11, items 1102, 1104; column 1, lines 35-51; column 19; lines 24-61).

18. With respect to claim 12 and 24, Bridge teaches of wherein one operation of the set of operations is one of the following: creating the first logical volume; growing the second logical volume; and adding a mirror to a third logical volume of the plurality of logical volumes (fig. 8, 9, 10a, 19, items 802-804, 910, 1004 respectively; column 16, lines 33-47; column 17, lines 27-34; column 17, lines 62-66; column 26, lines 57-65).

19. With respect to claim 25, the combination of Bridge and Vishlitzky teaches of a memory medium that stores instructions executable by a computer system, wherein

the computer system implements a method in response to executing the instructions (fig. 19; column 26, line 55-column 27, line 44), the instructions comprising: a first set of instructions configured to receive a request to create first and second logical volumes, wherein the first and second logical volumes are required to have first and second storage structures, respectively, and first and second storage quantities, respectively (Bridge, fig. 11; column 1, lines 35-51; column 19; lines 24-61; the extents must be indifferent failure groups and in full mirror partners. There must be enough storage space for the extents. In the combination of Bridge and Vishlitzky, the full mirror partner comprises multiple logical volumes. It is abundantly clear to one of ordinary skill in the art that as the actions are carried out in a computer system, the must be implemented by instructions);

a second set of instructions configured to select a first collection of physical memory regions; a third set of instructions configured to allocate the first collection of physical memory regions to create the first and second logical volumes (Bridge, fig. 11, items 1102, 1104; column 1, lines 35-51; column 19; lines 24-61; the first disk drive and its full mirror partners. In the combination of Bridge and Vishlitzky, the full mirror partner comprises multiple logical volumes);

a fourth set of instructions configured to determine whether the first and second logical volumes have the first and second storage quantities, respectively, and the first and second storage structures, respectively; a fifth set of instructions configured to select a second collection of physical memory regions, wherein the second collection is different from the first collection, if the first and second logical

volumes do not have the first and second storage quantities, respectively, and do not have the first and second storage structures, respectively (Bridge, fig. 11, items 1106; column 1, lines 35-51; column 19; lines 24-61).

With respect to claim 26, Bridge teaches of wherein the instructions further comprises: a fifth set of instructions configured to allocate the second collection of physical memory regions to create new first and second logical volumes; a sixth set of instructions configured to determine whether the new first and second logical volumes have the first and second storage quantities, respectively, and the first and second storage structures, respectively (Bridge; fig. 11; column 1, lines 35-51; column 19; lines 24-61; as when a sufficient mirror partner cannot be found, the primary extent is deallocated and a new primary parity extent is selected at 1102 again. In the combination of Bridge and Vishlitzky, the full mirror partner comprises multiple logical volumes).

Response to Arguments

20. Applicant's arguments, see page 11, lines 3-6, filed 6/26/2006, with respect to the rejection(s) of claim(s) 1-26 under 35 USC 102 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Bridge and Vishlitzky.

Conclusion

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Krofcheck whose telephone number is 571-272-8193. The examiner can normally be reached on Monday - Friday.

23. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

24. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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